

Amendments to the Claims

Please amend claims 1-10 and add new claim 11, without prejudice or disclaimer, as indicated in the following Listing of Claims.

Listing of Claims

1. (Currently amended) A method of producing an actuator for use in an injection arrangement, the method including comprising:

providing a block of ferroelectric material; cutting and/or shaping the block to a final size to provide a ferroelectric sample which that forms the an active element of the actuator, the ferroelectric sample having first and second opposing end faces (23), first and second opposing side faces (21), and a stack of ferroelectric layers (16), wherein adjacent layers of said stack (16) are separated from one another by internal electrodes (18a, 18b) arranged substantially parallel to the end faces (23) of the sample (14);

subsequent to the cutting and/or shaping step, applying a primary external electrode arrangement to the first and second end faces (23) of the sample; ;

immersing the sample and the primary electrode arrangement within a dielectric fluid;
applying a primary poling voltage to the primary external electrode arrangement so as to polarise polarize substantially the entire ferroelectric sample (14) along a single, first polarisation polarization axis in a first polarisation polarization direction; ;

applying a permanent secondary external electrode arrangement (30a, 30b) to the side faces of the sample (14) so that the secondary external electrode arrangement (30a, 30b) makes contact with the internal electrodes (18a, 18b); and

applying a secondary poling voltage to the secondary external electrode arrangement (30a, 30b) so as to polarise polarize alternate ones of the ferroelectric layers (16) along substantially the first polarisation polarization axis in the first polarisation polarization direction and the others of the ferroelectric layers (16) are polarised polarized along a second, oppositely directed polarisation polarization axis, thereby to polarise polarize substantially the entire sample (14) and avoiding discontinuities in ferroelectric strain throughout the sample (14).

2. (Currently amended) A The method as claimed in claim 1, wherein the step of applying the primary poling voltage is applied prior to the step of applying the secondary poling voltage.

3. (Currently amended) A The method as claimed in claim 1 or claim 2, including wherein said providing a ferroelectric sample (14) in which the internal electrodes (18a, 18b) are grouped into first and second interdigitated sets of electrodes, each set comprising a plurality of internal electrodes.

4. (Currently amended) A The method as claimed in any of claims 1 to 3 2, including further comprising a step of removing the primary external electrode arrangement from the sample prior to applying the secondary external electrode arrangement.

5. (Currently amended) A The method as claimed in any of claims 1 to 4 2, including further comprising a step of inserting the sample (14) between a pre-mounted primary external electrode arrangement so that first and second primary electrodes (24a, 24b) contact the first and second end faces (23) of the sample (14) respectively.

6. (Currently amended) A The method as claimed in any of claims 1 to 4 2, including further comprising a step of applying a conductive film to the first and second end faces (23) to provide first and second primary external electrodes (24a, 24b) of the primary external electrode arrangement.

7. (Currently amended) A The method as claimed in any of claims 1 to 4 2, including wherein said step of immersing the sample and the primary electrode arrangement within a dielectric fluid for the duration of is performed during the application of the primary poling voltage.

8. (Currently amended) A The method as claimed in claim 7 1, including further comprising a step of applying a heating effect to the sample (14) following application of the primary poling voltage to aid evaporation of the dielectric fluid from surfaces of the sample and/or the electrodes.

9. (Currently amended) A The method as claimed in any of claims 1 to 8 2, in which wherein the primary voltage is no greater than 4 kV.

10. (Currently amended) A The method as claimed in any of claims 1 to 9 2, in which wherein the secondary voltage is no greater than 200V.

11. (New) The method as claimed in any of claims 1 to 2, wherein said step of applying a primary poling voltage is performed while the sample and the primary electrode arrangement are immersed within a dielectric fluid.